Stanford MEDICINE
Dunlevie Maternal-Fetal Medicine
Center for Discovery, Innovation and Clinical Impact

CMQCC
California Maternal
Quality Care Collaborative

Obstetric Sepsis Treatment and Patient Debriefs

Webinar #3 in the Sepsis Collaborative Series

Speakers today:

Melissa Bauer, DO Sepsis Project Lead, Michigan AIM (Duke University)

Leah Bahrencu, MBA Sepsis patient survivor

Kayleigh Summers, LCSW Birth trauma councilor (AFE patient survivor)

Elliott K. Main, MD Sepsis Project Lead, California (Stanford University)

Supported by: NICHD UG3-HD108053: Large-scale Implementation of Community Co-led Maternal Sepsis Care Practices to Reduce Morbidity and Mortality from Maternal Infection

Sepsis Treatment and Escalation of Care

Melissa E Bauer, D.O.
Associate Professor of Anesthesiology
Associate Professor of Population Health Sciences
Duke University

Acknowledgement

- NIH/NICHD UG3/UH3 HD108053 (Contact PI)
  - Large-scale Implementation of Community Co-led Maternal Sepsis Care Practices to Reduce Morbidity and Mortality from Maternal Infection

Global Maternal Mortality Rates

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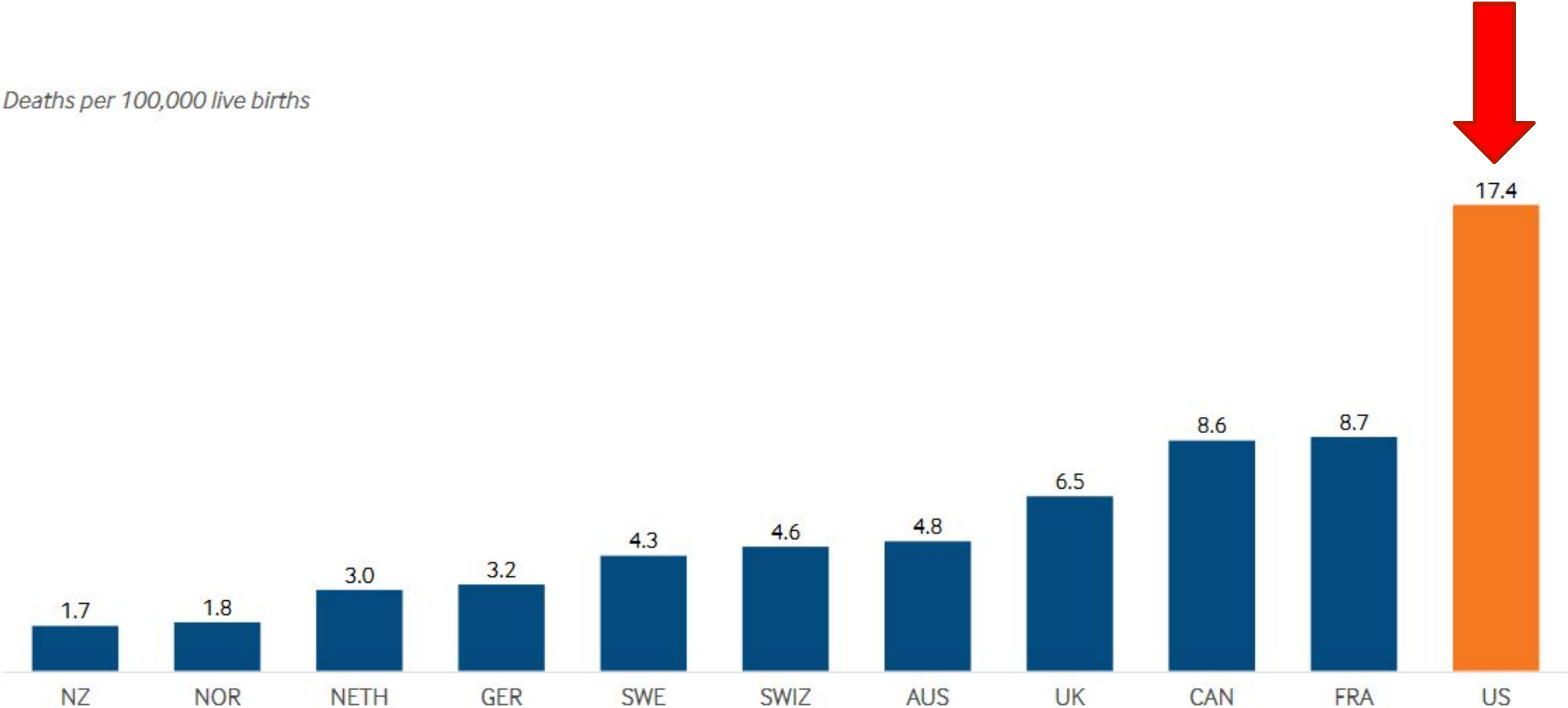

Roosa TikRoosa Tikkanen et al,. Commonwealth Fund, 2020.
https//doi.org/10.26099/411v-9255

Pregnancy-related deaths due to infection

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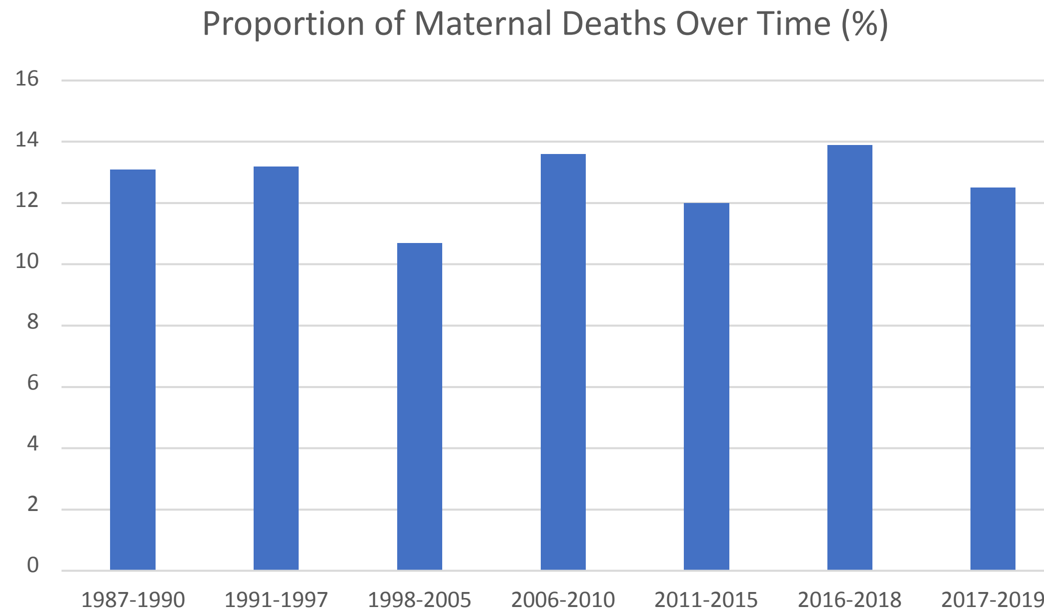
- 2nd-4th leading cause of maternal death in US, 3rd globally
- No change in the proportion of deaths over time (1987-2019)
    - Despite substantial improvement in mortality in the general population



Bauer et al. *Anesth Analg* (2013)
Hensley et al. *JAMA* (2019)
Kendle et al. *AJOG* (2019

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Preventability

California	North Carolina	Michigan
39% Preventable	43% Preventable	73% Preventable

Bauer *et al. Obstet Gynecol* (2015) Berg CJ *et al. Obstet Gynecol* (2005) Main EK *et al. Obstet Gynecol* (2015)

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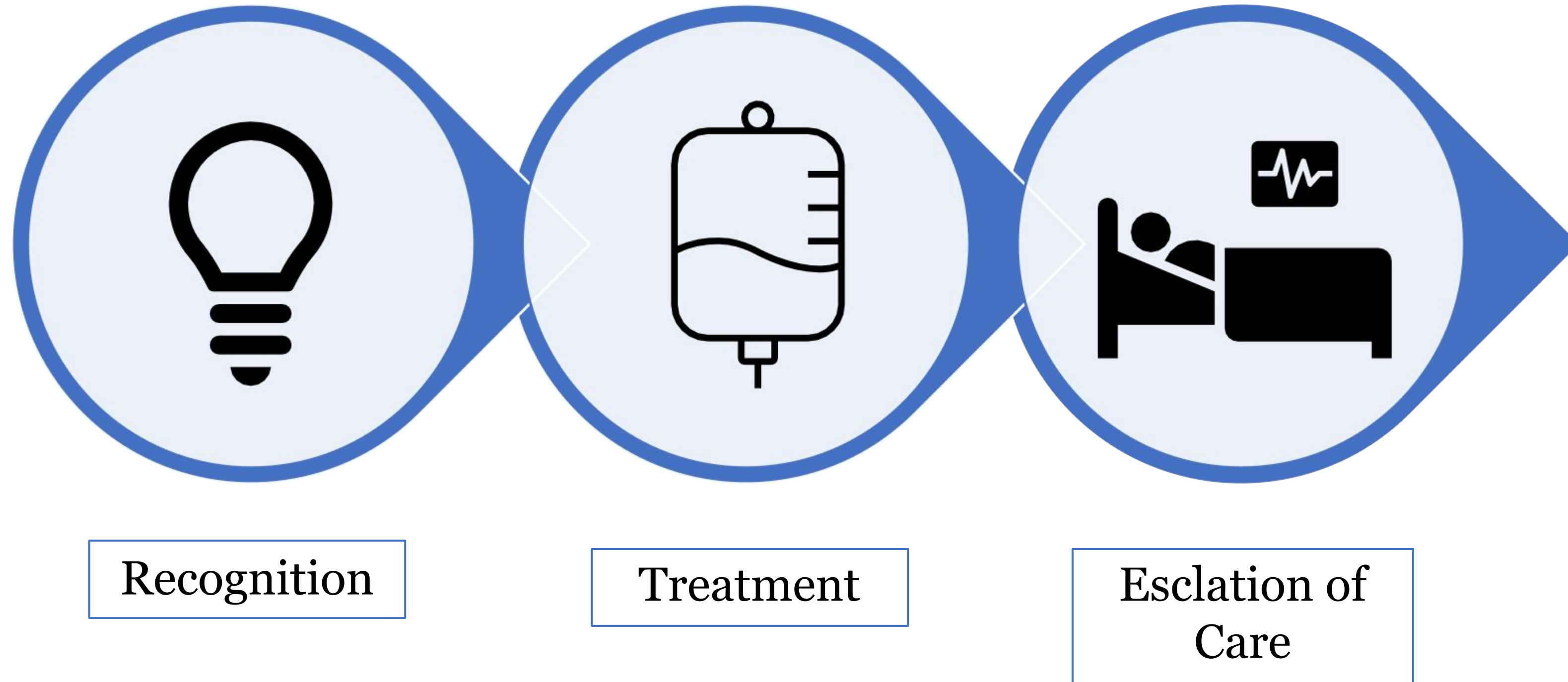
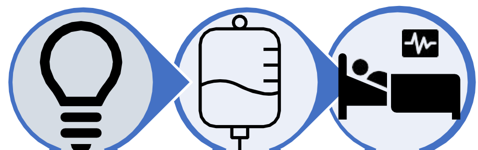
Three Deadly Delays





Seacrist et al. *JOGNN* 2019
Bauer et al. *Obstet Gynecol* 2015

Treatment

Antibiotics

Importance of prompt antibiotic therapy In Pregnant Patients

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- Antibiotics within one hour
  - 8% mortality
- Antibiotics after one hour
  - 20% mortality

Bauer ME *et al.* Anesth Analg (2018)

CMQCC Toolkit

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TABLE 9. Proposed Empiric Antibiotic Coverage for Patients with Sepsis of Unknown Source (with End Organ Injury) or Septic Shock

Antibiotic Choices *Empiric coverage for sepsis of unknown source or for septic shock should include at least one antibiotic for Gram-negative and anaerobic coverage **PLUS** one for Gram-positive coverage*	Duration
Gram-negative plus anaerobic coverage Piperacillin/tazobactam 3.375 g IV q8h (extended infusion) or 4.5 g IV q6h **OR** Meropenem 1 g IV q8h (if recent hospitalization or concern for MDRO organisms) **OR** Cefepime 1-2g IV q8h plus metronidazole 500 mg IV q8h **OR** Aztreonam 2 g IV q8h (for women with severe penicillin allergy) Plus metronidazole 500 mg IV q8h **OR** Aztreonam 2g IV q8h plus clindamycin 900 mg IV q8h **PLUS** **Gram-positive coverage** Vancomycin 15-20 mg/kg q8h-q12h (goal trough 15-20 mcg/mL) **OR** Linezolid 600 mg IV/PO q12h (for women with severe vancomycin allergy)	7-10 days is adequate for most infections

Surviving Sepsis Campaign: International Guidelines for Management of Sepsis and Septic Shock 2021

Recommendations
12. For adults with possible septic shock or a high likelihood for sepsis, we **recommend** administering antimicrobials immediately, ideally within one hour of recognition.
Strong recommendation, low quality of evidence (septic shock)
Strong recommendation, very low quality of evidence (sepsis without shock)

Evans et al. *Critical Care Med* (2021)

Maternal Deaths Due to Sepsis in the State of Michigan, 1999–2006

Only 13% (2/15) patients received appropriate initial antibiotics

After ICU or ID consult, 67% (10/15) were appropriate for clinical situation

- 20% (3/15) did not live long enough for subsequent therapy
- 13% (2/15) appropriateness was unable to be determined

Bauer et al. *Obstet Gynecol* (2015)

Combination therapy

- *Clindamycin with β-lactams to inhibit exotoxin production*
    - Group A streptococcus (7-10% of cases)

Systems-based solutions

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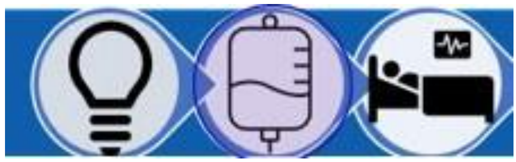
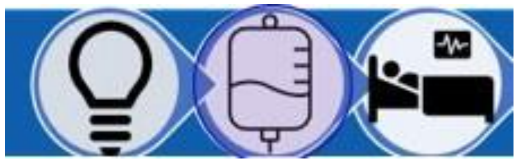
- Automated dispensing system availability
- IV access
- Pharmacy
- Waiting for transport



Fluid administration



Surviving Sepsis Campaign: International Guidelines for Management of Sepsis and Septic Shock 2021

5. For patients with sepsis induced hypoperfusion or septic shock we **suggest** that at least 30 mL/kg of IV crystalloid fluid should be given within the first 3 hours of resuscitation.

Weak recommendation, low-quality evidence.

7. For adults with sepsis or septic shock, we **suggest** guiding resuscitation to decrease serum lactate in patients with elevated lactate level, over not using serum lactate.

Weak recommendation, low-quality evidence.

Remarks:

During acute resuscitation, serum lactate level should be interpreted considering the clinical context and other causes of elevated lactate.

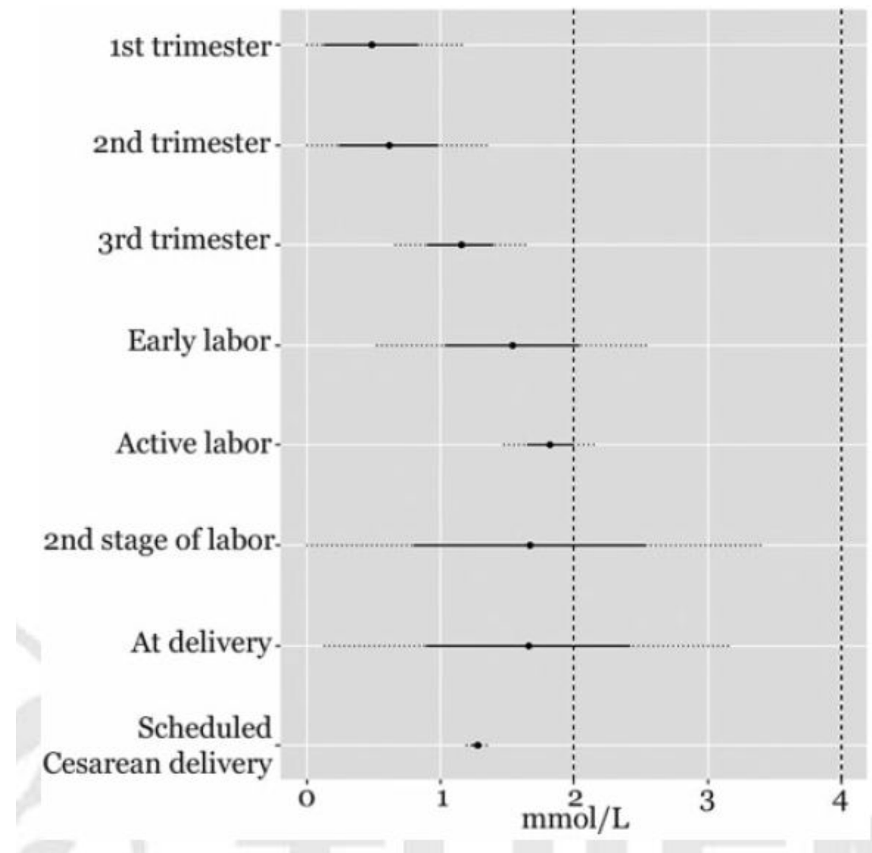
Evans et al. *Critical Care Med* (2021)

Normal Range for Maternal Lactic Acid during Pregnancy and Labor: A Systematic Review and Meta-Analysis of Observational Studies

- 22 studies
- 1,193 patients
- 2,008 observations

Bauer Am J Perinatol (2018)

During Pregnancy



Outside of labor
<2 mmol/L

Bauer Am J Perinatol (2018)

2nd stage of Labor

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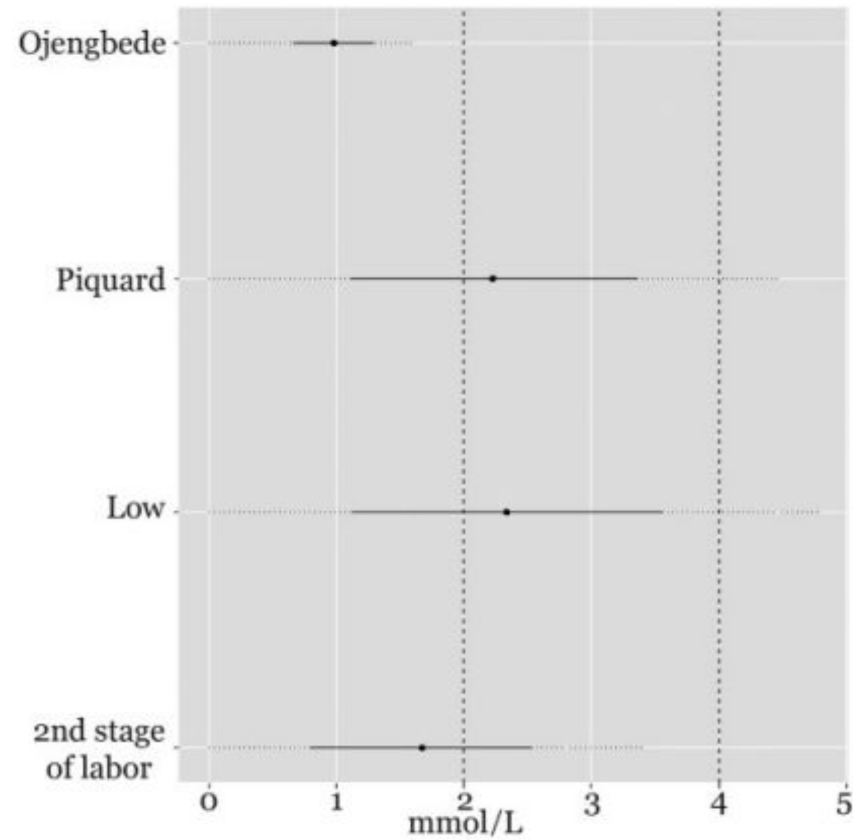

Bauer Am J Perinatol (2018)

At Delivery

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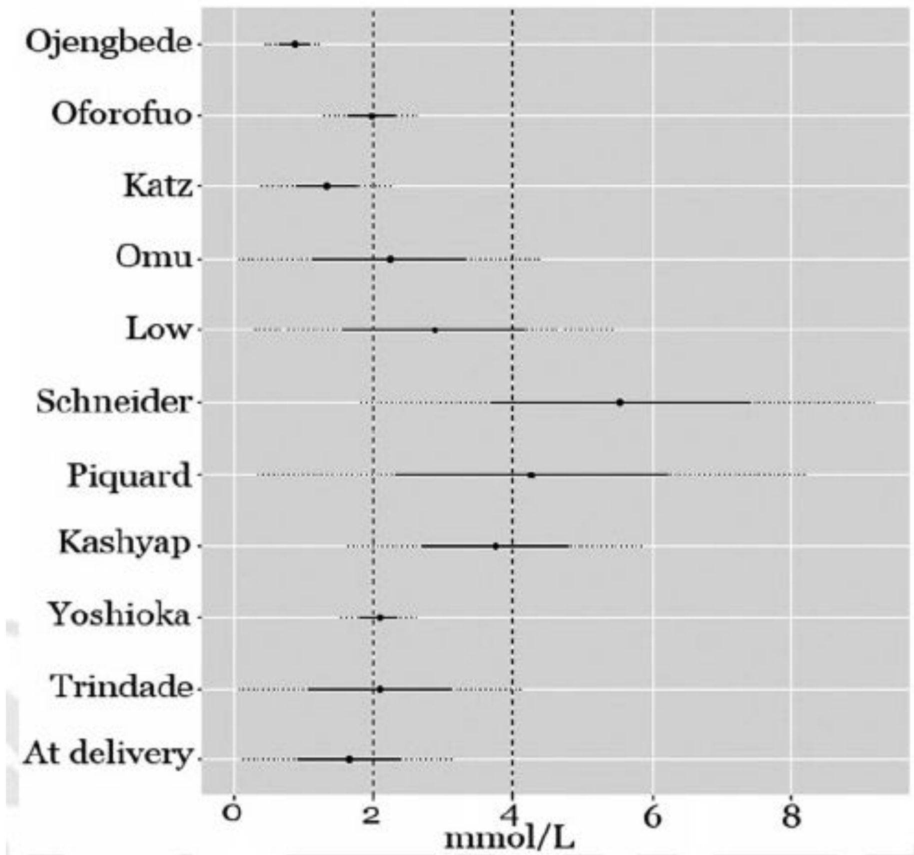

Should return back to
< 2 mmol/L
within 30- 60 minutes
After delivery

Bauer Am J Perinatol (2018)

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Escalation of Care

Sepsis in Obstetrics Score

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FIGURE 1
Sepsis in Obstetrics Score

Variable	High abnormal range				Normal	Low abnormal range			
Score	+4	+3	+2	+1	0	+1	+2	+3	+4
Temperature (°C)	>40.9	39-40.9		38.5-38.9	36-38.4	34-35.9	32-33.9	30-31.9	<30
Systolic Blood Pressure (mmHg)					>90		70-90		<70
Heart Rate (beats per minute)	>179	150-179	130-149	120-129	≤119				
Respiratory Rate (breaths per minute)	>49	35-49		25-34	12-24	10-11	6-9		≤5
SpO_2 (%)					≥92%	90-91%		85-89%	<85%
White Blood Cell Count (/μL)	>39.9		25-39.9	17-24.9	5.7-16.9	3-5.6	1-2.9		<1
% Immature Neutrophils			≥10%		<10%				
Lactic Acid (mmol/L)			≥4		<4				

Scoring template for S.O.S., a sepsis scoring system designed specifically for obstetric patients.

S.O.S., Sepsis in Obstetrics Score; *SpO_2*, blood oxygen saturation.

Albright. The Sepsis in Obstetrics Score. Am J Obstet Gynecol 2014.

Albright *et al. AJOG* (2014)

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Sepsis Calculator

Sepsis Obstetrics Scoring System			
Temperature (Centigrade) (° C) 36 - 38.4 C (96.8 - 101.1 F) ▼		SpO2% blood oxygen saturation >= 92% ▼	
Systolic blood pressure (mmHg) > 90 ▼		White blood count uL 5.7 - 16.9 ▼	
Heart Rate (beats per minute) <=119 ▼		% Immature Neutrophils <10% ▼	
Respiratory Rate (breaths per minute) 12 - 24 ▼		Lactic Acid (mmol/L) <4 ▼	

Calculate Sepsis Obstetrics Score (S.O.S)

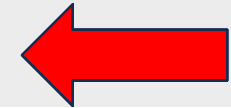
http://perinatology.com/calculators/Sepsis%20Calculator.htm

Provider Materials

The materials below are designed to support medical professionals with educating patients about the leading signs and symptoms of severe maternal events that could lead to complications and/or death. Materials are available to help providers communicate with patients about their condition.

Southeast Michigan Perinatal Quality Improvement Coalition (SEMPQIC)

Detroit Health Equity Education Resource

Escalation of care resource: Sepsis in Obstetrics Score Calculator 

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Action Items

- Recognition
  - Develop sepsis screening (prior lecture)
- Treatment
  - Work with pharmacy to obtain prompt antibiotics
  - Antibiotic selection
- Escalation of care
  - Have criteria for escalation of care

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Thank you

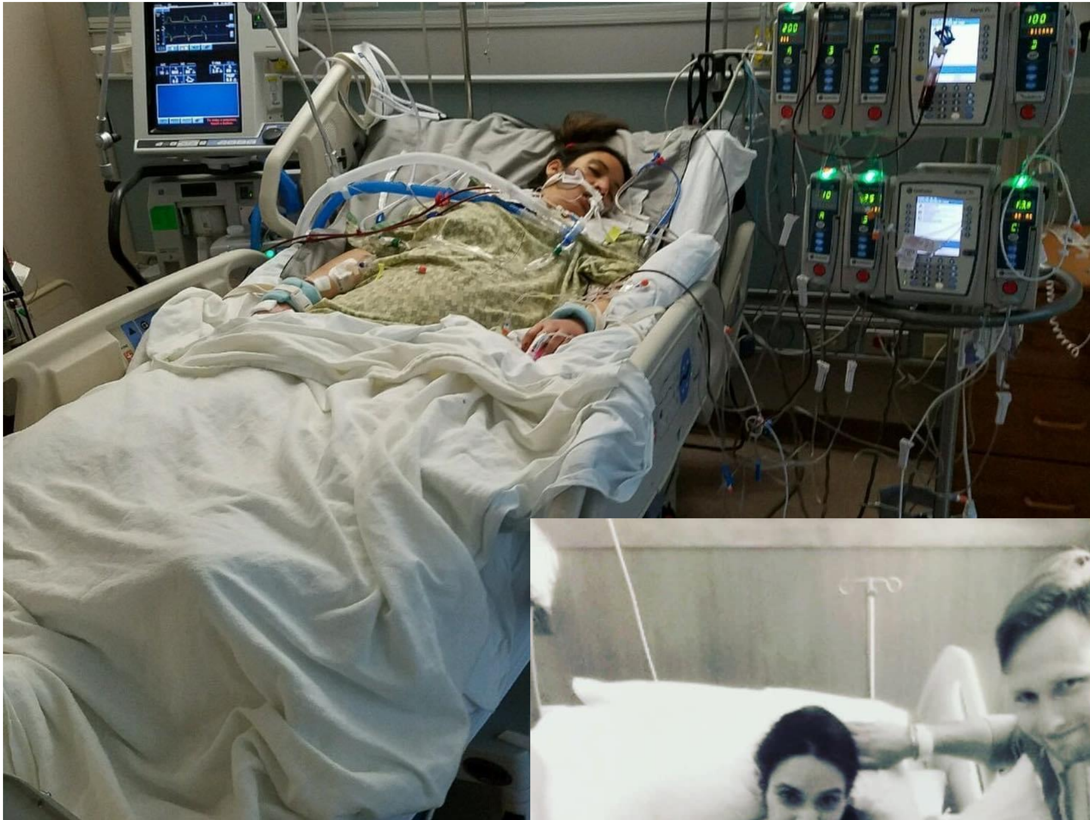
- Contact information: Melissa.e.bauer@duke.edu
- Twitter: @MelissaEBauer1

Leah Bahrencu

- Texas born and raised
- Wellness professional for 18+ years
- Married for 10 years (this month)
- Homeschool mama
- Sourdough baker
- Birth trauma survivor

May 2016: WAIT THERE’S TWO!

December 2016: 31 weeks



Our first meet 14 days after birth

- HELLP Syndrome & Preeclampsia
- Multiorgan Failure, DIC, **SEPSIS**
- Multiple Paracentesis
- Laparotomy from abscesses throughout abdomen and uterus

- Denial, Delay & Dismissal
- Encouraging patients to speak out
- Education during & after hospitalization
- Plan of action for long-term effects

I advocate for them

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Birth Trauma: Communication and Patient Debriefs

Kayleigh Summers, LCSW Birth trauma councilor (AFE patient survivor)

Elliott K. Main, MD Sepsis Project Lead, California (Stanford University)

Supported by: NICHD UG3-HD108053: Large-scale Implementation of Community Co-led Maternal Sepsis Care Practices to Reduce Morbidity and Mortality from Maternal Infection

Birth Trauma and Patient Debriefing Work Group

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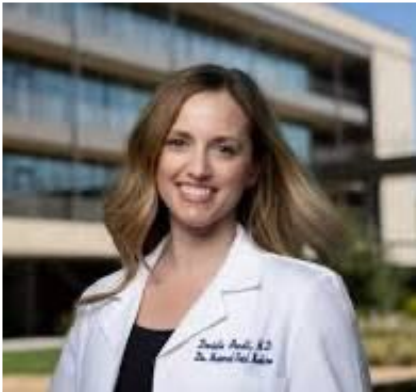
April Chavez, MA
Sepsis Survivor



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RNC-OB, EFM, MSN,
CNS
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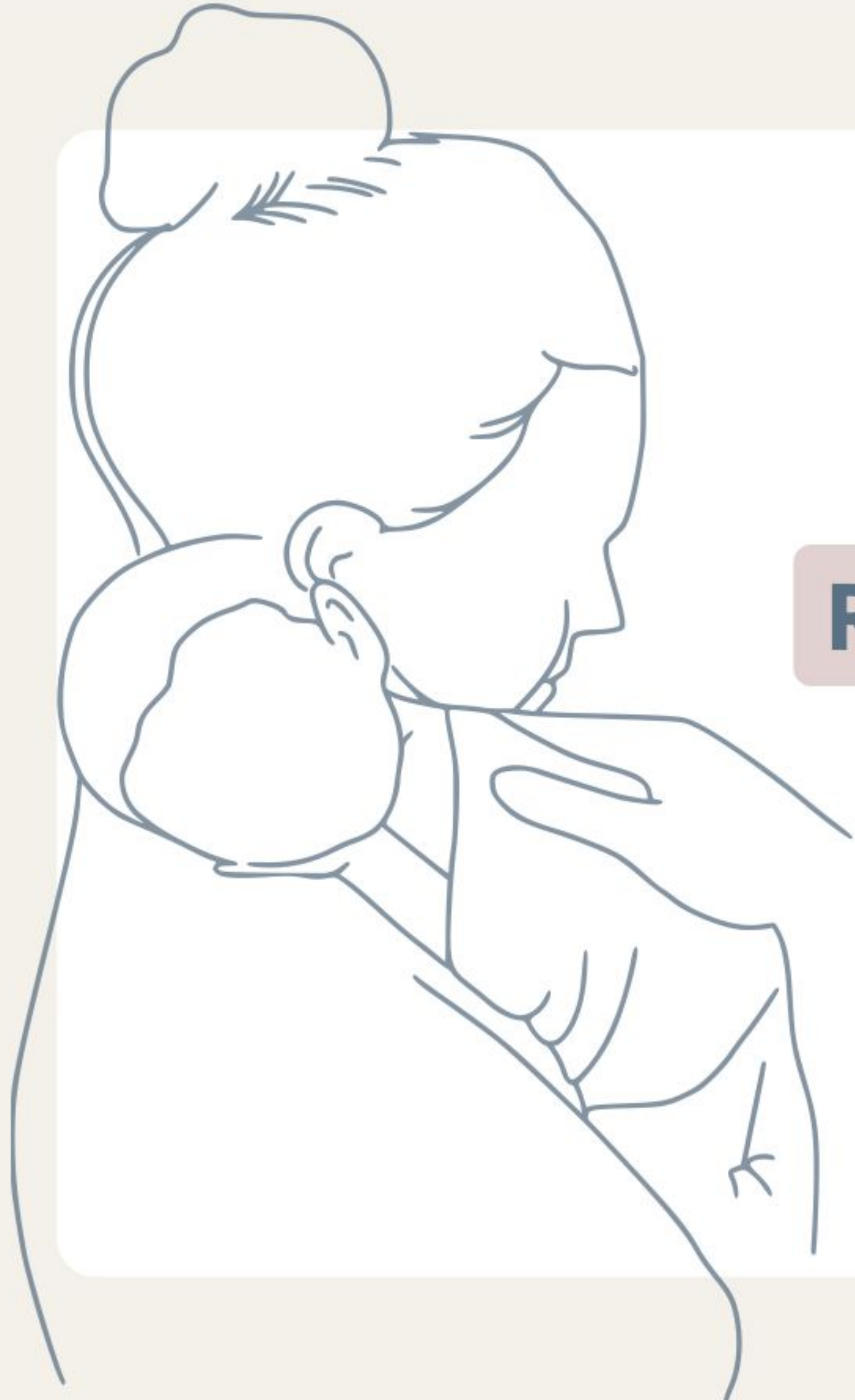
Kayleigh Summers
LCSW, AFE Survivor

Severe Maternal Events: Birth Trauma

- Breaking the connection
- What can we do?
- Tools for ALL types of Severe Maternal events



Responding To Patients After a Severe Maternal Event

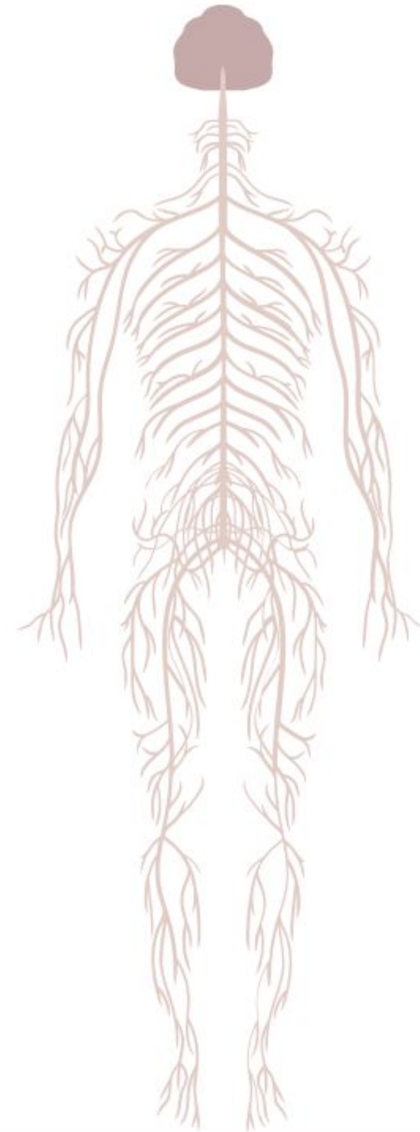
Kayleigh Summers, LCSW, PMH-C

the Birth Trauma mama

Any distressing event during or related to birth that overwhelms the nervous system's ability to cope.

the Birth Trauma mama

Trauma is a nervous system event, not a choice.



the Birth Trauma mama

Causes of Birth Trauma

Wide-ranging and subjective.

- Life-threatening or perceived life-threatening events for mom and/or baby
- Unexpected outcomes or events
- Lack of bodily autonomy or informed consent

the Birth Trauma mama

Why is this important?

- **Severe Maternal Morbidity appears to be associated with an increased risk for developing mental health conditions**
- **SMM was associated with a 1.3-fold increased rate of hospitalization/ED visit for a mental health condition up to 13 years postpartum.**

Lewkowitz AK, Rosenbloom JI, Keller M, López JD, Macones GA, Olsen MA, Cahill AG. Association Between Severe Maternal Morbidity and Psychiatric Illness Within 1 Year of Hospital Discharge After Delivery. Obstet Gynecol. 2019 Oct;134(4):695-707. doi: 10.1097/AOG.0000000000003434. PMID: 31503165; PMCID: PMC7035949.

Blackman A, Ukah UV, Platt RW, et al. Severe Maternal Morbidity and Mental Health Hospitalizations or Emergency Department Visits. JAMA Netw Open. 2024;7(4):e247983. doi:10.1001/jamanetworkopen.2024.7983

the Birth Trauma mama

Why is this important?

The way medical teams speak to patients after an SME is a piece of their story that they will take with them for the rest of their lives.

the Birth Trauma mama

The Goal: Mitigate further trauma and put patients on a trajectory toward healing.

the Birth Trauma mama

The patient and provider perspectives of an SME are likely to be different which can impact communication.

the Birth Trauma mama

Support After a Severe Maternal Event

How do we achieve this?

- According to 550+ birth trauma survivors:
  - Acknowledgment
  - Debrief

the Birth Trauma mama

Supportive Communication After SME

	Avoid		Instead	
	You should be so grateful.		I know this is probably scary and a lot to process. What questions can I can help you answer?”	
	You almost died, but we were able to save you.		“You were quite sick, but your body is very tough and resilient.”	
	Just focus on your baby.		“It’s okay if you don’t feel okay right now. You don’t have to. Here are some supports we have available to you.”	
	“Everything happens for a reason”		It was not your fault. Here’s what we know about why this may have happened to you.	
	Anything with “at least.”		“You’ve been through a lot. You are probably going to feel many complicated and conflicting emotions. That’s normal after an event like this.	

Referrals

Postpartum Support International

- **Provider directory**
- **Free Groups**
- **Helpline**

Specific Complication Support Groups

the Birth Trauma mama

Severe Maternal Events: Debriefs

What Happened?

- What was the condition?
- How was I treated?

What is Next?

- What should I expect in the next weeks?
- How does it affect me in the longer term?

Discharge debriefs are one part of a communication chain

Considerations for Setting-up the Pre-discharge Debrief

- Include patient and their support people of their chosing.
- Confirm preferred language. If needed, in person interpreters are preferred.
- We recommend that an OB Provider with another key clinician who knows the full story, an RN, and if appropriate, a Social Worker and/or a Case Manager attend the meeting.
- Review clinical course and documentation ahead of time with the healthcare providers who were involved.
- Clarify who will lead the discussion.

Plan What to Say

- Manage your emotions
- Acknowledge something unexpected as occurred
- Express empathy and concern
- Listen to the patient and their family and respond to their questions, allow them time to respond to your prompts.
- Address planned next steps
- Clearly delineate the contact person(s) for the patient and family, and when to expect a follow up discussion

Outline for the Pre-Discharge Debrief (1)

Step 1: Assess Patient Understanding

- “Now that you have had a few days to process, can you recap in your own words what you understand about what you experienced.” “In a moment we will go thru your story in detail.”
  - Do not stop the patient to correct information
- “What are your biggest concerns?

Outline for the Pre-Discharge Debrief (2)

Step 2: Provide an overarching description of the event

- Define (in lay terms) the condition that they experienced, including how common it is.
- Briefly review risk factors and in general the diagnosis and treatment approaches

Outline for the Pre-Discharge Debrief (3)

Step 3: What happened with this specific patient

- Review in lay terms, how the patient presented and how the diagnosis was made
- What specific consultations and treatments were made (a summary list on paper is very useful)
- How the patient responded to the treatments
- If and why they were transferred to a higher level of care (such as an ICU) and what happened there.
- What has happened in the recovery phase.

Outline for the Pre-Discharge Debrief (4)

Step 4: Pause for questions

- “I have just given you a lot of information.
  What questions do you have?
  What are your expectations going forward?”

Outline for the Pre-Discharge Debrief (5)

Step 5: Review what to expect next

- Review plans for discharge, including who and when to see for follow up (need to identify an “anchor” provider)
- Discuss return precautions and “what to watch for”, involving the patient’s family and/or those who may be helping support them
- Broadly review how this event may affect future health and future pregnancies, if relevant.
- Emphasize the important of continuing discussions

Post Discharge Follow-up After a Serious Adverse Event (1)

- Follow up within 1-2 weeks of hospital discharge with obstetric care provider
- Discharge summary/summary of hospital course sent to obstetrician/CNM and PCP
- Plan for where to go if there's a need to come back to the hospital
- Mental health assessment; below are examples of validated tools:
  - PHQ-9[1] (Patient Health Questionnaire, a 9-question depression assessment
  - GAD-7[1] (Generalized Anxiety Disorder 7-item assessment)
  - PCL-5[2] (PTSD Checklist for DSM-5, a 20-item assessment of PTSD symptoms)

Post Discharge Follow-up After a Serious Adverse Event (2)

- All patients with critical illness/ICU admission (for example; intubated, weakness) should have the following outpatient referrals placed on discharge:
  - Occupational therapy
  - Physical therapy
  - Speech evaluation (if trouble swallowing)

Postpartum Visit Assessments

- Hospital discharge medication lists should be reconciled
- Contraception needs, in the context of the serious adverse obstetric event
- Offer referral for mental health and other formal support services [good to provide an introduction as to benefit]
- Lactation/baby feeding needs
- Important to mobilize a support system of family and/or community social services, including doula care where available

Pre-Discharge Debriefs Summary

- A patient and family debrief before discharge is a key part of care
- A debrief is best done as a formal event
- A formal hand-off to the follow-up physician is very important step
- The debrief is but part of a larger continuum of communications that occurs daily during the hospital stay and continues into the postpartum period

Stay tuned for more Debriefing tools, details, and examples in the revised CMQCC Sepsis Toolkit.

Let us know what would help you to do debriefs!

Thank You !